

Claims:

1. A method for catalytically oxidizing organic molecules comprising:
passing a solution containing organic molecules over a catalyst to catalyze the oxidation of the organic molecules in the solution, said catalyst comprising a discrete mixture of platinum particles and cobalt particles.
2. The method as defined in claim 1 wherein said catalyst is supported on an electrode.
3. The method as defined in claim 1 wherein the solution containing organic molecules is a glucose solution.
4. A method for catalytically oxidizing organic molecules comprising:
passing a solution containing organic molecules over an electrode to catalyze the oxidation of the organic molecules in the solution, said electrode comprising a discrete mixture of platinum particles and cobalt particles.
5. The method as defined in claim 4 wherein the solution containing organic molecules is a glucose solution.
6. An apparatus for catalyzing the oxidation of organic molecules, said apparatus comprising:
an electrode structure having a surface defined by a discrete mixture of platinum particles and cobalt particles.
7. An apparatus as defined in claim 6 wherein said platinum is present in an amount within the range of about 52 to about 99 weight percent of the total weight of the composition.
8. An apparatus as defined in claim 6 wherein said cobalt is present in an amount within the range of about 48 to about 1 weight percent of the total weight of the composition.
9. An apparatus as defined in claim 6 wherein said composition further comprises metal oxides of said cobalt.

10. An apparatus as defined in claim 9 wherein said metal oxides of said cobalt are the products of reactive electrodeposition.

11. An apparatus as defined in claim 6 wherein said cobalt is present in an oxidation state of 0, 2, 8/3 or 3.

12. An apparatus as defined in claim 6 wherein said composition further comprises Sn in an amount not greater than about 10 atom percent of the total composition.

13. An apparatus as defined in claim 6 wherein said composition further comprises a mixture of carbon and polytetrafluoroethylene.

14. An apparatus as defined in claim 6 wherein said electrode is a metal electrode.

15. An apparatus as defined in claim 6 wherein said electrode is a metal foam electrode.

16. An apparatus as defined in claim 6 wherein said electrode is a graphite electrode.

17. An apparatus as defined in claim 6 wherein said electrode is a porous carbon electrode.

18. An apparatus as defined in claim 6 wherein said electrode is a flooded electrode.

19. An apparatus as defined in claim 6 wherein said electrode is an anode in an electrochemical device.

20. An apparatus as defined in claim 6 wherein said electrode is part of a fuel cell.

21. An apparatus as defined in claim 6 wherein said electrode is part of a reactor used to synthesize gluconic acid.

22. An apparatus as defined in claim 6 wherein said electrode is part of a glucose sensor.

23. An electrode structure comprising:

a platinum wire having a coating, said coating comprising a discrete mixture of platinum particles and cobalt particles.

24. The electrode structure as defined in claim 23 wherein said coating further comprises cobalt oxides.

25. An electrode structure comprising:
a platinum wire having a coating, said coating comprising cobalt particles.
26. An electrode structure comprising:
a nickel current collector having a coating, said coating comprising a mixture of activated carbon, acetylene black, PTFE and a catalyst, said catalyst comprising a discrete mixture of platinum particles and cobalt particles.
27. The electrode structure as defined in claim 26 wherein said nickel current collector is comprised of nickel foam.
28. The electrode structure as defined in claim 26 wherein said nickel current collector is comprised of nickel mesh.
29. A method for catalytically oxidizing glucose comprising:
passing a solution containing glucose molecules over a catalyst to catalyze the oxidation of the glucose molecules in the solution, said catalyst comprising a discrete mixture of platinum particles and cobalt particles.
30. The method as defined in claim 29 wherein said catalyst is supported on an electrode.
31. A method for catalytically oxidizing glucose comprising:
passing a solution containing glucose molecules over an electrode to catalyze the oxidation of the glucose molecules in the solution, said electrode comprising a discrete mixture of platinum particles and cobalt particles.
32. An apparatus for catalyzing the oxidation of glucose molecules, said apparatus comprising:
an electrode structure having a surface defined by a discrete mixture of platinum particles and cobalt particles.
33. An apparatus as defined in claim 32 wherein said platinum is present in an amount within the range of about 52 to about 99 weight percent of the total weight of the composition.

34. An apparatus as defined in claim 32 wherein said cobalt is present in an amount within the range of about 48 to about 1 weight percent of the total weight of the composition.
35. An apparatus as defined in claim 32 wherein said composition further comprises metal oxides of said cobalt.
36. An apparatus as defined in claim 35 wherein said metal oxides of said cobalt are the products of reactive electrodeposition.
37. An apparatus as defined in claim 32 wherein said cobalt is present in an oxidation state of 0, 2, $8/3$ or 3.
38. An apparatus as defined in claim 32 wherein said composition further comprises Sn in an amount not greater than about 10 atom percent of the total composition.
39. An apparatus as defined in claim 32 wherein said composition further comprises a mixture of carbon and polytetrafluoroethylene.
40. An apparatus as defined in claim 32 wherein said electrode is a metal electrode.
41. An apparatus as defined in claim 32 wherein said electrode is a metal foam electrode.
42. An apparatus as defined in claim 32 wherein said electrode is a graphite electrode.
43. An apparatus as defined in claim 32 wherein said electrode is a porous carbon electrode.
44. An apparatus as defined in claim 32 wherein said electrode is a flooded electrode.
45. An apparatus as defined in claim 32 wherein said electrode is an anode in an electrochemical device.
46. An apparatus as defined in claim 32 wherein said electrode is part of a fuel cell.
47. An apparatus as defined in claim 32 wherein said electrode is part of a reactor used to synthesize gluconic acid.
48. An apparatus as defined in claim 32 wherein said electrode is part of a glucose sensor.